REMARKS

Claims 1-8, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirashima (U.S. Publication Number 2003/0026178). Claims 20 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Katayama, *et al.* (JP Publication Number 10-055546). Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi, *et al.* in view of Hirashima. In view of the amendments to the claims and the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is requested.

In the present invention as claimed in claims 1-3, a focus search method includes generating a sine wave in response to a focus search command and performing a focus search by an optical pickup outputting a focus error signal in response to the sine wave. The sine wave is generated independently of the focus error signal.

Claims 1-3 are amended to clarify that the optical pickup outputs a focus error signal in response to the sine wave and the sine wave is generated independently of the focus error signal. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

In the present invention as claimed in claims 4-6, a focus search method includes generating a sine wave and performing a focus search using an optical pickup that outputs a focus error signal and ascends or descends toward or from an optical disc in response to an amplitude of the sine wave. The sine wave is generated independently of the focus error signal.

Claims 4-6 are amended to clarify that the optical pickup outputs a focus error signal in response to an amplitude of the sine wave and the sine wave is generated independently of the focus error signal. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

In the present invention as claimed in claims 7 and 8, a focus search method includes performing a focus search using an optical pickup that outputs a focus error signal and that ascends and descends toward or from an optical disc in response to an amplitude of a sine wave generated by a sine wave generator. The sine wave is generated independently of the focus error signal.

Claims 7 and 8 are amended to clarify that the optical pickup outputs a focus error signal in response to an amplitude of the sine wave and the sine wave is generated independently of the focus error signal. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

In the present invention as claimed in claims 13-14, a focus search method includes receiving a plurality of command signals and detecting focus-on conditions, and if the focus-on conditions are not satisfied, performing a focus search by an optical pickup outputting a focus error signal in response to a sine wave generated by a sine wave generator, and if the focus-on conditions are satisfied, performing a focus servo using the optical pickup in response to at least one of the plurality of command signals. The sine wave is generated independently of the focus error signal.

Claims 13-14 are amended to clarify that the optical pickup outputs a focus error signal in response to the sine wave and the sine wave is generated independently of the focus error signal. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

Hirashima discloses a driver 5 which drives a focusing actuator in a pickup 1 based on a focusing actuator drive signal, that is, the focusing servo signal F-SRV of focus search signal F-SRCH, supplied from servo circuit 4. Thus by changing over switch 48, it is possible to select a focus search mode or a focusing servo mode. A focusing error signal generating circuit generates a focusing error signal FE, see FIGs. 4A-4C, 6 and 7 of Hirashima, based on the signal supplied from the pickup 1, i.e., the focus search signal F-SRCH or the focusing servo signal F-SRV. The focusing servo is activated at the zero-crossing point of a focusing error signal FE immediately after the focusing error signal FE has exceeded a first threshold th1 or has dropped below a second threshold th2. The absolute value of the first threshold th1 and the second threshold th2 is reduced each time a predetermined time t is elapsed until the focusing servo is activated. The focusing error signal FE of Hirashima is generated in response to either the focus search signal F-SRCH or the focusing servo signal F-SRV, and the focus search signal F-SRCH or the focusing servo signal F-SRV are determined based on the focusing error signal FE.

In the present application, in all of claims 1-8, 13 and 14, the sine wave is generated completely independent of the focus error signal. That is, the sine wave is in no way derived from the focus error signal. The claimed focus error signal and sine wave of claims 1-8, 13 and 14 are separate signals.

Hirashima fails to teach or suggest a focus search method that includes generating a sine wave in response to a focus search command and performing a focus search by an optical pickup outputting a focus error signal in response to the sine wave, wherein the sine wave is generated independently of the focus error signal, as claimed in claims 1-3. Instead, in Hirashima, the focus error signal FE of FIG. 7 is generated in response to the focus search signal F-SRCH, and the focus search signal F-SRCH is determined based on the focusing error signal FE. Therefore, in Hirashima, a sine wave is not generated independently of the focus error signal FE.

Further, Hirashima fails to teach or suggest a focus search method that includes generating a sine wave and performing a focus search using an optical pickup that outputs a focus error signal and ascends or descends toward or from an optical disc in response to an amplitude of the sine wave, wherein the sine wave is generated independently of the focus error signal, as claimed in claims 4-6. Instead, in Hirashima, the focus error signal FE of FIG. 7 is generated in response to the focus search signal F-SRCH, and the focus search signal F-SRCH is determined based on the focusing error signal FE. Therefore, in Hirashima, a sine wave is not generated independently of the focus error signal FE.

In addition, Hirashima fails to teach or suggest a focus search method that includes performing a focus search using an optical pickup that outputs a focus error signal and that ascends and descends toward or from an optical disc in response to an amplitude of a sine wave generated by a sine wave generator, wherein the sine wave is generated independently of the focus error signal, as claimed in claims 7-8. Instead, in Hirashima, the focus error signal FE of FIG. 7 is generated in response to the focus search signal F-SRCH, and the focus search signal F-SRCH is determined based on the focusing error signal FE. Therefore, in Hirashima a sine wave is not generated independently of the focus error signal FE.

In addition, Hirashima fails to teach or suggest a focus search method that includes receiving a plurality of command signals and detecting focus-on conditions, and if the focus-on conditions are not satisfied, performing a focus search by an optical pickup outputting a focus error signal in response to a sine wave generated by a sine wave generator, wherein the sine wave is generated independently of the focus error signal, as claimed in claims 13-14. Instead, in Hirashima, the focus error signal FE of FIG. 7 is generated in response to the focus search signal F-SRCH, and the focus search signal F-SRCH is determined based on the focusing error signal FE. Therefore, in Hirashima a sine wave is not generated independently of the focus error signal FE.

Hirashima fails to teach or suggest certain elements of the invention set forth in claims 1-3, 4-6, 7-8 and 13-14. Therefore, it is believed that the amended claims are allowable over the cited reference, and reconsideration of the rejections of claims 1-8, 13 and 14 under U.S.C. 102(b) as being anticipated by Hirashima, is respectfully requested.

In the present invention as claimed in claims 15-18, a focus search method includes receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on, and adding a waveform for a focus search and the low-pass filtered signal during the focus search, and wherein the focus search starts from the low-pass filtered signal.

In the present invention as claimed in claim 19, a focus search method includes driving an optical pickup in response to a signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup.

Ishibashi, *et al.* discloses a read amplifier 3 which amplifies a signal read by an optical head 2 and outputs a read-out information signal HF and a focus error signal FE. An equalization filter is used as equalizing means by performing waveform equalization according to a cut-off frequency Fc for the read-out information signal HF, and outputs an equalization signal QF. A jitter measuring means 6 measures a jitter of the equalization signal QF and outputs the result as a jitter detection signal JT. A minimum value searching means 7 changes the focus position compensation signal ΔFE and the cut-off frequency Fc. An adder 8 adds the focus error signal FE output from the read amplifier 3 to the focus position compensation signal ΔFE output from the minimum value searching means 7 and outputs the result to a servo amplifier 4.

Ishibashi, *et al.* fails to teach or suggest a focus search method which includes receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on, and adding a waveform for a focus search and the low-pass filtered signal during the focus search, and wherein the focus search starts from the low-pass filtered signal, as claimed in claims 15-18. Instead, in Ishibashi, *et al.*, the adder 8 adds the focus error signal FE and a focus position compensation signal ΔFE output from the minimum value searching means 7, rather than a low-pass filtered signal as claimed. The equalization signal QF of Ishibashi, *et al.* is output to the jitter measuring means 6 which measure a jitter of the equalization signal QF and outputs the result to the minimum value searching means 7 as a jitter detection signal JT. The equalization signal QF is in no way added to a waveform for a focus search, as claimed. In addition, the focus search of Ishibashi, *et al.* does not start from the equalization signal QF. In addition, Ishibashi, *et al.* does not disclose a method of outputting a signal form a focus loop filter during a focus-on.

Hirashima in no way teaches or suggests a low pass filter or a focus loop filter. Therefore, like Ishibashi, *et al.*, Hirashima fails to teach or suggest a focus search method which includes receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on, and adding a waveform for a focus search and the low-pass filtered signal during the focus search, and wherein the focus search starts from the low-pass filtered signal, as claimed in claims 15-18.

The Office Action states at page 7, lines 11-15, that Ishibashi, *et al.* does not disclose a method of outputting a signal from a focus loop filter during a focus-on and if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output during the focus on and before the focus drop occurs using the optical pickup. Therefore, Ishibashi, *et al.* further fails to teach or suggest a focus search method which includes driving an optical pickup in response to a signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19.

Hirishima in no way teaches or suggests a filter. Therefore, Hirishima, like Ishibashi, *et al.* fails to teach or suggest a focus search method which includes driving an optical pickup in response to a signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19.

Hence, neither of Ishibashi, *et al.* and Hirishima teaches or suggests certain elements of the present invention set forth in claims 15-18 and 19. Specifically, neither of Ishibashi, *et al.* and Hirishima teaches or suggests a focus search method which includes receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on, and adding a waveform for a focus search and the low-pass filtered signal during the focus search, and wherein the focus search starts from the low-pass filtered signal, as claimed in claims 15-18, and a focus search method which includes driving an optical pickup in response to a signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup, as claimed in claim 19. Accordingly, there is no combination of the references which would provide such teaching or suggestion. Neither of the references, taken alone or in combination, teaches or suggests the invention set forth in claims 15-18 and 19. Therefore, it is believed that claims 15-18 and 19 are allowable over the cited references, and reconsideration of the rejections of claims 15-19 under 35 U.S.C. § 103(a) based on Ishibashi, *et al.* and Hirishima is respectfully requested.

In the present invention as claimed in claim 20, a focus search method includes calculating an average value for the signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and the average value.

In the present invention as claimed in claim 24, a focus search method includes receiving a focus search OK signal and determining a logic state of the focus OK signal.

In the present invention as claimed in claims 25-26, a focus search method includes receiving a focus OK signal and, if the focus OK signal is logic "low", generating a waveform for the focus search having a first slope, and if the focus OK signal is logic "high" generating a waveform having a second slope.

Katayama, *et al.* discloses, in FIGs. 2a, 2b and 2c, that a sum signal waveform is set at a prescribed level and when the search signal waveform reaches this level, its waveform inclination is made to be gentle. A focusing point is recognized by the difference signal. That is, a search is commenced, and when the sum signal of FIG. 2b becomes equal to or more than the prescribed level, a start speed is lowered to make the inclination of the search signal waveform of 2(a) loose. Katayama, *et al.* discloses, in FIGs. 5a and 5b, that a first focus search is performed such that a draw is purposely not made and the electrical potential difference of the focusing point of the first focus search is memorized. When performing a second focal search, the memorized focusing point is used such that the inclination of a search signal wave form is gently changed near a focusing point (see FIG. 5a). Katayama, *et al.* further discloses, in FIGs. 8 and 9, an operation part of a focal control system which is an optical disk control device and it is constituted so that a FOKASU error signal may take a reference voltage Vref lead. If a focal error signal is outputted focusing on Vref, an output will be set to 0 when the input of a driver 64 is Vref. When an electrical potential difference inputted into a driver 64 is lower than Vref, a + current flows to a focal actuator 65, and when the electrical potential difference inputted into a driver 64 is lower than Vref, a – current flows to the focal actuator 65.

Katayama, *et al.* fails to teach or suggest a focus search method that includes calculating an average value for the signal output from a focus loop filter during a focus-on and, if a focus drop occurs after the focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and the average value, as claimed in claim 20. Instead, in Katayama, *et al.*, there is no teaching or suggestion that the sum signal of FIG. 2b is calculated as an average value for a signal output from a focus loop filter during a focus-on, as claimed. In addition, there is no teaching or suggestion in Katayama, *et al.* of adding the waveform for the focus search and the average value, as claimed. Rather, in Katayama, *et al.*, when the sum signal of FIG. 2b becomes equal to or more than the prescribed level, a start speed is lowered to make the inclination of the search signal waveform of FIG. 2a loose. The search signal waveform of FIG. 2a with the sum signal of FIG. 2b.

Katayama, *et al.* further fails to teach or suggest a focus search method which includes receiving a focus search OK signal and determining a logic state of the focus OK signal, as claimed in claim 24. Instead, in Katayama, *et al.*, the FOKASU error signal is adjusted based on the relation of the electrical potential difference inputted into a driver 64 relative to Vref such that it may center on Vref. Katayama, *et al.* in no way teaches or suggests determining a logic state of the FOKASU error signal.

Katayama, *et al.* further fails to teach or suggest a focus search method which includes receiving a focus OK signal and, if the focus OK signal is logic "low", generating a waveform for the focus search having a first slope, and if the focus OK signal is logic "high" generating a waveform having a second slope, as claimed in claims 25-26. Instead, in FIGs. 5a and 5b of Katayama, *et al.*, the first focus search is performed such that a draw is purposely not made and the electrical potential difference of the focusing point of the first focus search is memorized and, when performing a second focal search, the memorized focusing point is used such that the inclination of a search signal wave form is gently changed near a focusing point. While the slope of the search signal wave form of Katayama, *et al.* discloses a first slope and a second slope, the change in slope is not based on whether a focus OK signal is logic "low" or logic "high". In addition, the change of slope of FIG. 2a is based on whether the sum signal of FIG. 2b has reached a predetermined level, not based on whether a focus OK signal is logic "low" or logic "high".

Katayama, *et al.* fails to teach or suggest certain elements of the invention set forth in claims 20, 24 and 25-26. Therefore, it is believed that the amended claims are allowable over the cited reference, and reconsideration of the rejections of claims 20 and 24-26 under U.S.C. 102(b) as being anticipated by Katayama, *et al.*, is respectfully requested.

In view of the amendments to the claims and the foregoing remarks, it is believed that all claims pending in the application are in condition for allowance, and such allowance is respectfully solicited. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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